WHAT WE CLAIM IS:

1. An energy attenuation apparatus for a system conveying a liquid under pressure, said apparatus comprising:

a liquid-conveying means in which said apparatus is disposed, wherein said liquid-conveying means includes three chambers disposed in series, wherein one of said chambers contains no tubes;

a first tube disposed in a second one of said chambers, wherein an annular space is formed between an inner peripheral surface of said liquid-conveying means and an outer peripheral surface of said first tube, wherein said first tube has a first end connected to and in fluid communication with an inlet or outlet end of said second one of said chambers, wherein said first tube has a second, free end that is spaced by an open gap from said outlet or inlet end of said second one said chambers, and wherein said first tube has at least one aperture in said free end and/or on said peripheral surface thereof for providing fluid communication between said first tube and said second one of said chambers; and

a second tube disposed in a third one of said chambers, wherein an annular space is formed between an inner peripheral surface of said liquid-conveying means and an outer peripheral surface of said second tube, wherein said second tube has a first end connected to and in fluid communication with an inlet or outlet end of said third one of said chambers, wherein said second tube has a second, free end that is spaced by an open gap from said outlet or inlet end of said third one of said chambers, and wherein said second tube has at least one aperture in said free end and/or on said peripheral surface thereof for providing fluid communication between said second tube and said third one of said chambers.

2. An energy attenuation apparatus according to claim 1, wherein said chambers are separated from, and communicate with, one another via respective restrictor means.

3. An energy attenuation apparatus according to

claim 1, wherein said chambers are separated from, and communicate with, one another via respective tubing means.

4. An energy attenuation apparatus according to claim 1, wherein said first and second ones of said chambers are separated from, and communicate with, one another via a restrictor means, and said second and third ones of said chambers are separated from, and communicate with, one another via a tubing means.

5. An energy attenuation apparatus according to claim 1, wherein said first and second ones of said chambers are separated from, and communicate with, one another via a tubing means, and said second and third ones of said chambers are separated from, and communicate with, one another via a restrictor means.

6. An energy attenuation apparatus according to claim 1, wherein said chamber that contains no tube can be any one of said three chambers.

7. An energy attenuation apparatus according to claim 1, wherein said free ends of first and second tubes are open to provide said aperture therein, and said peripheral surfaces of said first and second tubes have no apertures.

8. An energy attenuation apparatus according to claim 1, wherein at least one of said peripheral surfaces of said first and second tubes is provided with at least one aperture, and said free ends of said first and second tubes are open or closed.

9. An energy attenuation apparatus according to claim 1, wherein said free ends of said first and second tubes are spaced by an open gap ranging from 10 to 500mm from said outlet or inlet end of their respective chamber.

10. An energy attenuation apparatus according to claim 1, wherein a first one of said chambers contains no tube, wherein said first tube is disposed in an intermediate one of said chambers, and wherein said second tube is disposed in a third one of said chambers.

11. An energy attenuation apparatus according to claim 10,wherein said chambers are separated from, and communicate with, one another via a respective restrictor means or tubing means, wherein said first ends of said tubes are connected to respective ones of said restrictor means or tubing means, and wherein said free ends of said tubes are spaced from said outlet end of the chamber in which said tube is disposed.

12. An energy attenuation apparatus according to claim 10, wherein said chambers are separated from, and communicate with, one another via respective restrictor means or tubing means, wherein said first ends of said tubes are connected to the outlet end of the chamber in which said tube is disposed, and wherein said free ends of said tubes are spaced from respective ones of said restrictor means or said tubing means.

13. An energy attenuation apparatus according to claim 1, wherein an intermediate one of said chambers contains no tube, with said first tube being disposed in a said first one of said chambers and said second tube being disposed in a third one of said chambers.

14. An energy attenuation apparatus according to claim 13, wherein said chambers are separated from, and communicate with, one another via a respective restrictor means or tubing means, wherein said first ends of said tubes are connected to respective ones of said restrictor means or tubing means, and wherein said free ends of said tubes are spaced from said outlet end of the chamber in which said tube is disposed.

15. An energy attenuation apparatus according to claim 13, wherein said chambers are separated from, and communicate with, one another via respective restrictor means or tubing means, wherein said first ends of said tubes are connected to the outlet end of the chamber in which said tube is disposed, and wherein said free ends of said tubes are spaced from respective ones of said restrictor means or said tubing means.

16. An energy attenuation apparatus according to

claim 1, wherein a third one of said chambers contains no tube, wherein said first tube is disposed in a first one of said chambers, and wherein said second tube is disposed in an intermediate one of said chambers.

17. An energy attenuation apparatus according to claim 16, wherein said chambers are separated from, and communicate with, one another via a respective restrictor means or tubing means, wherein said first ends of said tubes are connected to respective ones of said restrictor means or tubing means, and wherein said free ends of said tubes are spaced from said outlet end of the chamber in which said tube is disposed.

18. An energy attenuation apparatus according to claim 16, wherein said chambers are separated from, and communicate with, one another via respective restrictor means or tubing means, wherein said first ends of said tubes are connected to the outlet end of the chamber in which said tube is disposed, and wherein said free ends of said tubes are spaced from respective ones of said restrictor means or said tubing means.

19. An energy attenuation apparatus for a system conveying a liquid under pressure, said apparatus comprising:

a liquid-conveying means in which said apparatus is disposed, wherein said liquid conveying means includes three chambers disposed in series, wherein two of said chambers contain no tube; and

a tube disposed in a third one of said chambers, wherein an annular space is formed between an inner peripheral surface of said liquid-conveying means and an outer peripheral surface of said tube, wherein said tube has a first end connected to and in fluid communication with an inlet or outlet end of said third one of said chambers, wherein said tube has a second, free end that is spaced by an open gap from said outlet or inlet end of said third one of said chambers, and wherein said tube has at least one aperture in said free end and/or on said peripheral surface thereof for providing fluid communication between said tube and said third one of said chambers.

20. A method of attenuating energy in a system conveying a liquid under pressure, including the steps of:

disposing in said system a liquid-conveying means that includes three chambers disposed in series, wherein at least one of said chambers contains no tube;

disposing in at least one of said chambers a tube such that an annular space is formed between an inner peripheral surface of said liquid-conveying means and an outer peripheral surface of said tube;

connecting a first end of said tube to and in fluid communication with an inlet or outlet end of its chamber;

spacing a second, free end of said tube by an open gap from said outlet or inlet end of said chamber; and

providing said tube with at least one aperture in said free end and/or on said peripheral surface thereof for providing fluid communication between said tube and its chamber.